PB-239 656

MOOSEHEAD LAKE, PISCATAQUIS AND SOMERSET COUNTIES, MAINE

Pacific Northwest Environmental Research Laboratory

Prepared for:

National Environmental Research Center
Maine National Guard
Maine Department of Environmental Protection

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT
ON

MOOSEHEAD LAKE
PISCATAQUIS AND SOMERSET COUNTIES
MAINE

EPA REGION I

WORKING PAPER NO. 2

WITH THE COOPERATION OF THE

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

AND THE

MAINE NATIONAL GUARD

MAY, 1974

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FOREWORD

The National Eutrophication Survey was initiated in 1972 as a research project in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations and impact on selected fresh water lakes as a basis for formulating comprehensive and coordinated national, regional and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations and impacts can, in fact, be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

This report documents the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin. It is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/ standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Maine Department of Environmental Protection for professional involvement and to the Maine National Guard for conduct of the tributary sampling phase of the Survey.

William R. Adams, Commissioner of the Department of Environmental Protection, and William P. Hinckley and Matthew Scott of the Division of Lakes and Biological Studies, provided invaluable lake documentation and counsel during the course of the study.

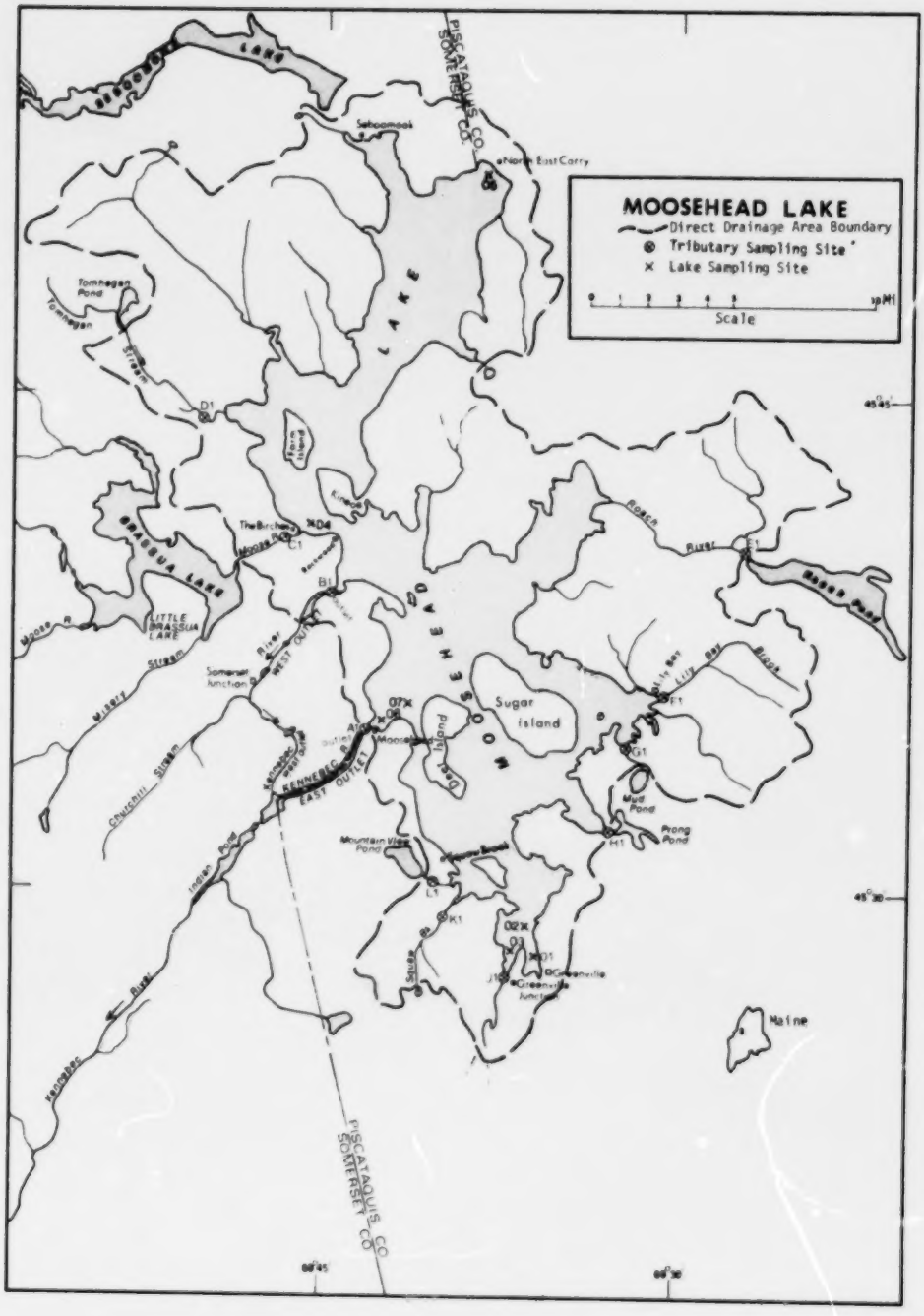
Major General Edwin W. Heywood (Retired), then the Adjutant General of Maine, and Project Officer Lieutenant Colonel Earl B. Adams who directed the volunteer efforts of the forty-one participating Maine National Guardsmen are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF MAINE

LAKE NAME	COUNTY
Moosehead Lake	Piscataquis, Somerset
Estes Lake	York
Long Lake	Cumberland
Bay of Naples & Sebago Lake	Cumberland
Rangeley Lake	Franklin
Long Lake	Aroostook
Mattawamkeag Lake	Aroostook
Sebasticook Lake	Penobscot


MOOSEHEAD LAKE
Direct Drainage Area Boundary
Tributary Sampling Site
Lake Sampling Site
Scale
MOOSEHEAD LAKE
Sugar Island
Greenville
Maine
PISCATAQUIS CO
SOMERSET CO

MOOSEHEAD LAKE

STORET NO. 2309

I. CONCLUSIONS

A. Trophic Condition:

High water clarity and dissolved oxygen values observed in association with low nutrient levels and chlorophyll a concentrations are indicative of an oligotrophic condition in Moosehead Lake. This conclusion is corroborated by personnel of the Maine Department of Environmental Protection and the Department of Inland Fisheries and Game.

B. Rate-Limiting Nutrient:

Algal assay results and nutrient concentration ratios observed in lake waters indicate Moosehead Lake was phosphorus limited when sampled. However, nutrient spiked subsample growth yields suggest nitrogen limitation would occur with an approximate two fold increase in orthophosphorus concentration (to about 16 µg/l, assuming constant inorganic nitrogen levels).

C. Nutrient Sources; Controllability:

1. Point Sources - Other than septic tank seepage, there are no known point source discharges to the Moosehead Lake drainage basin. However, a grant has been awarded recently to the Moosehead Sanitary District for construction of a collection system and tertiary treatment plant to serve the villages of Greenville and Greenville Junction. Although plant effluent will be discharged to the lake, the required combination of high treatment and phosphorus removal should not compromise Moosehead Lake water quality.

2. Non-Point Sources - Over 99% of calculated phosphorus and nitrogen loadings can be attributed to non-point sources. The Moose River, draining approximately 63% of the total lake watershed, contributes 40.1% of the total phosphorus and 43.1% of total nitrogen. Notwithstanding the percentages attributable to this and other areal sources, comparison of observed phosphorus loading rates with the Vollenweider model indicate no apparent threat to present lake trophic condition.

II. INTRODUCTION

Moosehead Lake is the largest lake in the State of Maine and is the headwater of the Kennebec River. The watershed is predominantly forested. The lake level is controlled for hydroelectric storage by the Kennebec Water Power Company; other industrial uses include pulpwood storage and transport. The lake is not used as a municipal water supply; however, some shoreline camps and dwellings use the lake as a source of water.

Moosehead Lake has been famous for salmon and trout fishing since the middle of the 19th century; reportedly, no other Maine lake studied provides a better habitat for salmon, brook trout, and lake trout. Other recreational uses include aesthetics, boating, and swimming, although low water temperatures are said to discourage whole-body contact recreation.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry:

1. Surface area: 74,890 acres
2. Mean depth: 54 feet
3. Maximum depth: 246 feet
4. Volume: 4,043,760 acre/ft
5. Mean hydraulic retention time: 3 years

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries* -

Name	Drainage area†	Mean flow†
Moose River	720.0 mi^2	1,104.6 cfs
Tomhegan Stream	23.7 mi^2	39.4 cfs
Roach River	69.6 mi^2	116.6 cfs
Lily Bay Brook	13.4 mi^2	26.8 cfs
Mud Brook	4.6 mi^2	7.9 cfs
Beaver Creek	9.0 mi^2	14.7 cfs
Unnamed Brook (J-1)	7.3 mi^2	14.0 cfs
Squaw Brook	7.0 mi^2	13.0 cfs
Upper Squaw Brook	5.8 mi^2	9.4 cfs
Minor tributaries & immediate drainage -	289.0 mi^2	522.0 cfs
Totals	1,149.4 mi^2	1,868.4 cfs

* Mean flows based on the period October 1, 1961 - September 30, 1971
† Drainage areas are accurate within ±1% and mean annual flows within ±5%.

Name	Drainage area	Mean flow†
2. Outlet -		
Kennebec River (East Outlet)	1,266.4 mi^2*	1,804.1 cfs
West Outlet	1,266.4 mi^2*	64.2 cfs
Totals	1,266.4 mi^2	1,868.3 cfs

C. Precipitation**:

1. Year of sampling: 56.0 inches
2. Mean annual: 43.3 inches

*Includes area of lake
**See Working Paper No. 1, "Survey Methods."
†See preceding page

IV. LAKE WATER QUALITY SUMMARY

Moosehead Lake was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from seven stations on the lake and from a number of depths at each station (see map, page v). During each visit a single depth-integrated (15 feet or less to surface depending on station depth) sample was composited from the seven stations for phytoplankton identification and enumeration; and during the last visit, three five-gallon depth-integrated samples were composited from three groups of stations (1,2, and 3; 4 and 5; and 6 and 7) for algal assays. Also, each time depth-integrated samples were collected at the stations for chlorophyll a analyses. Maximum depths sampled were 11 feet at station 1, 9 feet at station 2, 39 feet at station 3, 8 feet at station 4, 17 feet at station 5, 13 feet at station 6, and 100 feet at station 7.

It should be noted that the Survey Secchi disc values are consistently less than those observed by the Maine Department of Environmental Protection. Such variations could be attributed to fluctuations in cloud cover or sun angle (ambient light conditions), observer technique, water surface disturbance, or may, in fact, be the result of short-term water clarity differences.

The results obtained are presented in full in Appendix B; and the data for the fall sampling period, when the lake was essentially well-mixed, are

summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

FALL VALUES

(10/01/72)

Parameter	Minimum	Mean	Median	Maximum
Temperature (Cent.)	12.6	13.7	13.8	14.1
Dissolved oxygen (mg/l)	9.0	9.3	9.2	12.4
Conductivity (µmhos)	50	50	50	50
pH (units)	6.6	6.7	6.7	7.0
Alkalinity (mg/l)	10	10	10	10
Total P (mg/l)	0.006	0.009	0.009	0.013
Dissolved P (mg/l)	0.005	0.007	0.007	0.009
NO_2 + NO_3 (mg/l)	0.080	0.137	0.140	0.150
Ammonia (mg/l)	0.030	0.045	0.040	0.080

ALL VALUES

Secchi disc (inches)	90	149	144	264

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Number per ml
06/05/72	1. Dinobryon	49
	2. Synedra	30
	3. Cryptomonas	22
	4. Asterionella	20
	5. Peridinium	10
	Other genera	37
	Total	168

Sampling Date	Dominant Genera	Number per ml
08/09/72	1. Dinobryon	197
	2. Cyclotella	51
	3. Merismopedia	45
	4. Polycystis	34
	5. Fragilaria	34
	Other genera	124
	Total	485
10/01/72	1. Fragilaria	2,387
	2. Cyclotella	1,382
	3. Melosira	1,005
	4. Anabaena	477
	5. Aphanothece	402
	Other genera	1,558
	Total	7,211

2. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
06/05/72	01	1.2
	02	0.6
	03	0.6
	04	1.2
	05	1.1
	06	1.2
	07	1.0
08/09/72	01	2.8
	02	3.3
	03	2.0
	04	2.2
	05	2.0
	06	1.2
	07	1.2

Sampling Date	Station Number	Chlorophyll a (µg/l)
10/01/72	01	1.7
	02	1.5
	03	1.3
	04	-
	05	1.1
	06	1.1
	07	1.3

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked (composite - stations 1,2, and 3) -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.001	0.149	0.3
0.006 P	0.007	0.149	0.7
0.012 P	0.013	0.149	2.8
0.024 P	0.025	0.149	2.9
0.060 P	0.061	0.149	2.7
0.060 P + 10.0 N	0.061	10.149	26.2
10.0 N	0.001	10.149	0.2

2. Autoclaved, filtered, and nutrient spiked (composite - stations 4 and 5) -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.010	0.099	0.8
0.006 P	0.016	0.099	1.7
0.012 P	0.022	0.099	1.7
0.024 P	0.034	0.099	1.8
0.060 P	0.070	0.099	1.8
0.060 P + 10.0 N	0.070	10.099	34.9
10.0 N	0.010	10.099	1.0

3. Autoclaved, filtered, and nutrient spiked (composite - stations 6 and 7) -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.004	0.122	0.3
0.006 P	0.010	0.122	0.8
0.012 P	0.0.6	0.122	1.8
0.024 P	0.028	0.122	1.6
0.060 P	0.064	0.122	1.9
0.060 P + 10.0 N	0.064	10.122	27.8
10.0 N	0.004	10.122	0.2

4. Discussion -

The three control yields of the assay alga, Selenastrum capricornutum, indicate the potential primary productivity of Moosehead Lake was relatively low at the time the samples were collected. Also, in each assay, the increased yield resulting from the first orthophosphorus spike shows that Moosehead Lake was phosphorus limited. At ortho-P concentrations higher than about 0.013 to 0.016 mg/l, yields did not change significantly until nitrogen was also added which indicates the lake would become nitrogen limited if ortho-P concentrations in the lake were increased to about 0.016 mg/l (note that the addition of only nitrogen produced yields not significantly different than the control yields).

The minor differences in yields in the three assays are due to differences in the initial (control) concentrations

of phosphorus which may have resulted from the autoclaving of the samples, sample storage or actual differences between the sampling sites.

Lake data indicate that Moosehead Lake was phosphorus limited at the other sampling times as well (nitrogen to phosphorus ratios exceeded 25 to 1; i.e., phosphorus limitation would be expected).

D. Trophic Condition

Survey data indicate that Moosehead Lake is oligotrophic. Nutrient and chlorophyll a concentrations were very low and Secchi disc transparencies were exceptional, even though perhaps in error (see page 6). No depression of oxygen below saturation was noted at any depth (to 53 feet) except for the August sample at station 3, at the 15-foot level, which was recorded as 7.4 mg/l (82% of saturation). This is probably an analytical or recording error, however, since samples collected at the same time above (at 4 feet) and below (at 25 feet) were both oxygen-saturated.

V. NUTRIENT LOADINGS*
(See Appendix B for data)

For the determination of nutrient loadings, from September 1972, through August 1973, the Maine National Guard collected monthly near-surface grab samples from the tributary sites indicated on the map (page v), except for the high runoff months of April and May when two samples per month were collected. Stream flow estimates were provided by the Maine District Office of the U. S. Geological Survey through an interagency agreement.

In this report, tributary nutrient loads were calculated with mean concentrations and mean flows. The loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were calculated using mean ZZ flows and mean Tomhegan Stream concentrations at station D-1.

There were no municipal or industrial point sources discharging to the Moosehead Lake drainage system during the Survey sampling year.

A. Waste Sources:

1. Municipal - None known

2. Industrial - None known

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Moose River	21,740	40.1
Tomhegan Stream	1,160	2.1
Roach River	1,840	3.4
Lily Bay Brook	630	1.2

* Based on sampling frequency and variations in concentrations, single tributary loadings for gaged sites are believed to be within ±16% of the true value 67% of the time and within ±32% of the true value 95% of the time.

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Mud Brook	220	0.4
Beaver Creek	290	0.5
Unnamed Brook (J-1)	580	1.1
Squaw Brook	220	0.3
Upper Squaw Brook	200	0.3
b. Minor tributaries & immediate drainage (non-point load)*-	15,410	28.4
c. Municipal STP's -		
None known	-	-
d. Septic tanks** -	300	0.6
e. Industrial -		
None known	-	-
f. Direct Precipitation* -	11,700	21.6
Total	54,270	100.0
2. Outputs -		
Kennebec River, East Outlet	28,410	96.6
West Outlet	1,010	3.4
Total	29,420	100.0
3. Net annual P accumulation -	24,850 lbs	

* Estimated; see Working Paper No. 1, "Survey Methods".
** Estimated 900 dwellings around lake; 25% permanent residences.

C. Annual Total Nitrogen Loading - Average Year:

1 1. Inputs -

Source	lbs N/ yr	% of total
a. Tributaries (non-point load) -		
Moose River	1,161,210	43.1
Tomhegan Stream	40,800	1.5
Roach River	112,940	4.2
Lily Bay Brook	33,450	1.2
Mud Brook	12,470	0.5
Beaver Creek	15,110	0.6
Unnamed Brook (J-1)	28,000	1.0
Squaw Brook	8,320	0.3
Upper Squaw Brook	8,460	0.6
b. Minor tributaries & immediate drainage (non-point load)* -	540,430	20.1
c. Municipal STP's -		
None known	-	-
d. Septic tanks** -	11,320	0.4
e. Industrial -		
None known	-	-
f. Direct precipitation* -	722,360	26.8
Total	2,694,870	100.0

2. Outputs -

Kennebec River, East Outlet	1,960,480	97.0
West Outlet	60,540	3.0
Total	2,021,020	100.0

3. Net annual N accumulation - 673,850 lbs.

* Estimated; see Working Paper No. 1, "Survey Methods".
** Estimated 900 dwellings around lake; 25% permanent residences.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
Moose River	30	1,613
Tomhegan Stream	49	1,722
Roach River	26	1,623
Lily Bay Brook	47	2,496
Mud Brook	48	2,711
Beaver Brook	32	1,679
Unnamed Brook (J-1)	79	3,836
Squaw Brook	29	1,189
Upper Squaw Brook	34	1,459

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (1973). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

Units	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
lbs/acre/yr	0.7	0.3	36.0	9.0
grams/m^2/yr	0.08	0.03	4.0	1.0

Vollenweider loading rates for phosphorus (g/m^2/yr) based on mean depth and mean hydraulic retention time for Moosehead Lake:

"Dangerous" (eutrophic rate)	0.46
"Permissible" (oligotrophic rate)	0.23

E. Controllability of Nutrients:

1. Discussion -

During the sampling year, it is estimated that less than 1% of the phosphorus load to Moosehead Lake was contributed by point sources (septic tanks), and it is noted that the annual total phosphorus loading rate was well below the "permissible" (oligotrophic) rate proposed by Vollenweider.

The impact of the Moosehead Sanitary District tertiary treatment plant effluent on the overall trophic condition of Moosehead Lake should be minimal; and, as long as the proposed high level of 90+% phosphorus removal is maintained, there should be little, if any, localized effect in the cove receiving the effluent.

VI. LITERATURE REVIEWED

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TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2309 MOOSEHEAD LAKE

TOTAL DRAINAGE AREA OF LAKE 1266.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2309A1	1266.00	1658.00	1278.00	1817.00	2410.00	2820.00	2454.00	599.00	2533.00	2368.00	1831.00	2124.00	1906.00	1985.06
2309B1	1266.00	58.00	46.00	38.00	50.00	114.00	84.00	76.00	62.00	66.00	58.00	55.00	62.00	64.24
2309C1	720.00	1167.00	600.00	597.00	794.00	2845.00	1340.00	918.00	1101.00	1039.00	831.00	929.00	1035.00	1104.59
2309D1	23.70	19.00	14.00	25.00	127.00	107.00	32.00	16.00	13.00	14.00	24.00	46.00	35.00	39.37
2309F1	69.60	143.00	102.00	79.00	156.00	208.00	136.00	81.00	37.00	78.00	149.00	106.00	123.00	116.59
2309F1	13.40	11.00	9.10	19.00	105.00	57.00	18.00	9.50	7.10	9.70	19.00	35.00	23.00	26.85
2309G1	4.61	5.50	4.30	11.00	27.00	15.00	4.80	2.10	1.70	1.90	3.70	9.10	8.20	7.86
2309H1	9.04	10.00	8.60	22.00	52.00	26.00	8.90	3.80	2.70	3.30	6.40	18.00	15.00	14.71
2309J1	7.29	7.40	5.70	16.00	54.00	26.00	8.40	3.70	2.80	4.40	8.20	19.00	12.00	13.95
2309K1	6.96	8.20	5.90	12.00	41.00	33.00	10.00	4.60	3.80	4.00	7.30	14.00	12.00	12.99
2309L1	5.83	7.60	5.50	12.00	27.00	23.00	7.00	3.00	2.50	2.30	4.00	9.00	9.20	9.35
2309Z2	406.00	374.00	313.00	620.00	1520.00	1313.00	509.00	188.00	123.00	125.00	201.00	525.00	451.00	521.93

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 1266.00
SUM OF SUB-DRAINAGE AREAS = 1266.43

TOTAL FLOW IN = 22356.84
TOTAL FLOW OUT = 24567.00

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2309A1	9	72	2255.00	16	1580.00				
	10	72	1503.00	14	727.00				
	11	72	897.00	4	683.00				
	12	72	1542.00	10	896.00				
	1	73	1395.00	6	1160.00				
	2	73	2163.00	4	285.00				
	3	73	2573.00	3	3890.00				
	4	73	4500.00	7	5170.00	21	596.00		
	5	73	6911.00	5	7940.00	19	5190.00		
	6	73	2589.00	2	4300.00				
	7	73	3310.00	14	1740.00				
	8	73	1758.00	17	1370.00				
2309B1	9	72	20.00	16	20.00				
	10	72	20.00	14	20.00				
	11	72	40.00	4	36.00				
	12	72	40.00	10	40.00				
	1	73	50.00	6	50.00				
	2	73	40.00	4	45.00				
	3	73	35.00	3	35.00				
	4	73	40.00	7	35.00	21	45.00		
	5	73	65.00	5	40.00	19	75.00		
	6	73	75.00	2	75.00				
	7	73	70.00	14	70.00				
	8	73	60.00	17	60.00				

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2309 MOOSEHEAD LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2309C1	9	72	232.00	14	232.00				
	10	72	1250.00	14	1480.00				
	11	72	1570.00	4	961.00				
	12	72	1970.00	10	2550.00				
	1	73	573.00	6	533.00				
	2	73	976.00	4	970.00				
	3	73	369.00	3	533.00				
	4	73	2380.00	7	284.00	21	602.00		
	5	73	3730.00	5	7750.00	19	5200.00		
	6	73	1570.00	2	4300.00				
	7	73	1060.00	14	885.00				
	8	73	887.00	17	970.00				
2309D1	9	72	45.00	16	21.00				
	10	72	36.00	14	28.00				
	11	72	92.00	4	79.00				
	12	72	55.00	10	76.00				
	1	73	32.00	6	22.00				
	2	73	46.00	4	132.00				
	3	73	74.00	3	17.00				
	4	73	159.00	7	89.00	21	207.00		
	5	73	154.00	5	137.00	19	143.00		
	6	73	42.00	2	192.00				
	7	73	90.00	14	47.00				
	8	73	130.00	17	60.00				
2309E1	9	72	112.00	16	87.00				
	10	72	397.00	14	386.00				
	11	72	247.00	4	230.00				
	12	72	167.00	10	194.00				
	1	73	159.00	6	134.00				
	2	73	218.00	4	423.00				
	3	73	485.00	3	301.00				
	4	73	114.00	7	11.00	21	185.00		
	5	73	449.00	5	423.00	19	432.00		
	6	73	87.00	2	151.00				
	7	73	339.00	14	278.00				
	8	73	275.00	17	219.00				
2309F1	9	72	31.00	16	15.00				
	10	72	29.00	14	22.00				
	11	72	70.00	4	60.00				
	12	72	36.00	10	50.00				
	1	73	19.00	6	13.00				
	2	73	30.00	4	86.00				
	3	73	56.00	3	13.00				
	4	73	131.00	7	73.00	21	170.00		
	5	73	82.00	5	73.00	19	76.00		
	6	73	23.00	2	44.00				
	7	73	53.00	14	25.00				
	8	73	71.00	17	43.00				

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2309 MOOSEHEAD LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2309G1	9	72	6.10	16	2.90				
	10	72	5.60	14	4.30				
	11	72	18.00	4	15.00				
	12	72	13.00	10	18.00				
	1	73	9.30	6	6.40				
	2	73	14.00	4	40.00				
	3	73	32.00	3	7.40				
	4	73	34.00	7	19.00	21	44.00		
	5	73	22.00	5	20.00	19	20.00		
	6	73	6.20	2	12.00				
	7	73	12.00	14	5.60				
	8	73	17.00	17	10.00				
2309H1	9	72	11.00	16	5.20				
	10	72	9.70	14	7.50				
	11	72	36.00	4	31.00				
	12	72	24.00	10	33.00				
	1	73	17.00	6	12.00				
	2	73	28.00	4	81.00				
	3	73	65.00	3	15.00				
	4	73	65.00	7	36.00	21	84.00		
	5	73	37.00	5	33.00	19	34.00		
	6	73	12.00	2	23.00				
	7	73	21.00	14	9.90				
	8	73	27.00	17	16.00				
2309J1	9	72	14.00	16	6.60				
	10	72	12.00	14	9.20				
	11	72	38.00	4	33.00				
	12	72	19.00	10	26.00				
	1	73	13.00	6	9.00				
	2	73	19.00	4	55.00				
	3	73	47.00	3	11.00				
	4	73	68.00	7	38.00	21	88.00		
	5	73	37.00	5	33.00	19	34.00		
	6	73	11.00	2	21.00				
	7	73	21.00	14	9.90				
	8	73	28.00	17	17.00				
2309K1	9	72	13.00	16	6.10				
	10	72	11.00	14	8.50				
	11	72	28.00	4	24.00				
	12	72	19.00	10	26.00				
	1	73	14.00	6	9.70				
	2	73	19.00	4	55.00				
	3	73	35.00	3	8.00				
	4	73	51.00	7	29.00	21	68.00		
	5	73	48.00	5	43.00	19	45.00		
	6	73	13.00	2	25.00				
	7	73	26.00	14	12.00				
	8	73	38.00	17	23.00				

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2309 MOOSEHEAD LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2309L1	9	72	7.40	16	3.50				
	10	72	6.10	14	4.70				
	11	72	18.00	4	15.00				
	12	72	15.00	10	21.00				
	1	73	13.00	6	9.00				
	2	73	18.00	4	52.00				
	3	73	35.00	3	8.00				
	4	73	34.00	7	19.00	21	44.00		
	5	73	33.00	5	29.00	19	31.00		
	6	73	9.10	2	17.00				
	7	73	17.00	14	8.00				
	8	73	25.00	17	15.00				
2309Z2	9	72	401.00						
	10	72	306.00						
	11	72	1040.00						
	12	72	713.00						
	1	73	632.00						
	2	73	1070.00						
	3	73	1820.00						
	4	73	1900.00						
	5	73	1890.00						
	6	73	662.00						
	7	73	1060.00						
	8	73	1230.00						

APPENDIX B

PHYSICAL AND CHEMICAL DATA

K - Value is less than indicated
J - Value known to be in error

STORET RETRIEVAL DATE 74/06/25

230901
45 27 48.0 069 35 48.0
MOOSEHEAD LAKE
23 MAINE

11EPALES
3

2111202
0011 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	09 12 0000		8.2	12.0	120	10	7.00	10K	0.160	0.040	0.003	0.002
	09 12 0010		8.2	11.2		10	6.80	10K	0.160	0.040	0.005	0.003
72/08/09	08 35 0000				144	50K	6.70	10	0.140	0.140	0.003	0.002K
	08 35 0004		18.8	8.8		50K	6.70	11	0.060	0.060	0.002K	0.002K
	08 35 0011		18.7	8.6		50K	6.70	10	0.150	0.070	0.002	0.002
72/10/01	10 05 0000				120	50K	6.60	10K	0.130	0.040	0.010	0.007
	10 05 0004		12.7	9.4		50K	6.92	10K	0.130	0.040	0.009	0.006
	10 05 0009		12.6	9.2		50K	7.00	10K	0.130	0.040	0.009	0.006

23

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	09 12 0000		1.2J
72/08/09	08 35 0000		2.8J
72/10/01	10 05 0000		1.7J

STORET RETRIEVAL DATE 74/06/25

230902
45 28 24.0 069 36 06.0
MOOSEHEAD LAKE
23 MAINE

11EPALES 2111202
3 0010 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	10 40	0000	8.3	12.1	100	10	6.90	10K	0.170	0.020	0.002	0.002K
	10 40	0009	7.7	12.3		10	6.80	10K	0.160	0.010	0.002	0.002K
72/08/09	09 00	0000			132	50K	6.80	10K	0.160	0.160	0.007	0.002
	09 00	0004	18.7	9.0		50K	6.80	10	0.050	0.060	0.002K	0.002K
	09 00	0009	18.6	9.0		50K	6.70	10	0.150	0.050	0.002K	0.002K
72/10/01	10 30	0000			102	50K	6.75	10K	0.140	0.070	0.010	0.008
	10 30	0005	13.1	9.6		50K	6.85	10K	0.130	0.040	0.008	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	10 40	0000	0.6J
72/08/09	09 00	0000	3.3J
72/10/01	10 30	0000	1.5J

STORET RETRIEVAL DATE 74/06/25

230903
45 28 06.0 069 37 06.0
MOOSEHEAD LAKE
23 MAINE

11EPALES
3

2111202
0011 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	11 00	0000	8.0	11.9	144	10	6.90	10K	0.170	0.030	0.002	0.002
	11 00	0010	7.8	12.0		10	6.90	10K	0.160	0.040	0.002	0.002K
72/08/09	09 25	0000			182	50K	6.80	10K	0.160	0.110	0.002K	0.002K
	09 25	0004	18.4	9.0		50K	6.80	10K	0.080	0.020	0.002K	0.002K
	09 25	0015	18.2	7.4		50K	6.80	10K	0.070	0.030	0.002K	0.002K
	09 25	0025	18.1	9.0		50K	6.80	10K	0.070	0.020	0.006	0.002
	09 25	0035	13.4	9.4		50K	6.50	10K	0.100	0.060	0.002	0.002K
	09 25	0039	11.7	11.8		50K	6.50	10K	0.030	0.030	0.005	0.002
72/10/01	10 50	0000			204	50K	6.75	10K	0.140	0.040	0.010	0.008
	10 50	0004		9.2		50K	6.65	10K	0.130	0.030	0.009	0.006
	10 50	0015	13.5	9.0		50K	6.70	10K	0.140	0.040	0.007	0.006
	10 50	0022	13.5	9.2		50K	6.60	10K	0.140	0.040	0.007	0.007
	10 50	0029	13.5	9.2		50K	6.90	10K	0.140	0.040	0.007	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	11 00	0000	0.6J
72/08/09	09 25	0000	2.0J
72/10/01	10 50	0000	1.3J

STORET RETRIEVAL DATE 74/06/25

230904
45 41 00.0 069 45 54.0
MOOSEHEAD LAKE
23 MAINE

11EPALES
3

2111282
0011 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	11 30	0000	14.3	10.9	90	10	6.80	10K	0.130	0.030	0.004	0.003
	11 30	0010	14.3	10.9		10	6.90	10K	0.130	0.030	0.005	0.003
72/08/09	17 45	0000			96	50K	6.70	10K	0.120	0.110	0.007	0.005
	17 45	0004	20.2	9.0		50K	6.70	10K	0.010K	0.050	0.006	0.003
	17 45	0008	18.6	9.0		50K	6.70	10K	0.100	0.010K	0.005	0.004
72/10/01	15 05	0000			96			10K	0.080	0.040	0.009	0.007
	15 05	0004	13.5	9.0		50K	6.80	10K	0.090	0.070	0.010	0.009

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	11 30	0000	1.2J
72/08/09	17 45	0000	2.2J
72/10/01	15 05	0000	1.1

STORET RETRIEVAL DATE 74/06/25

230905
45 51 36.0 069 38 00.0
MOOSEHEAD LAKE
23 MAINE

11EPALES
3

2111202
0019 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	12 05	0000	12.8	11.2	192	10	7.00	10K	0.160	0.030	0.002	0.002
	12 05	0005	12.1	11.3		10	7.20	10K	0.150	0.020	0.002	0.002
	12 05	0012	9.1	11.9		10	7.10	10K	0.150	0.010K	0.002	0.002
	12 05	0017	8.2	12.0		10	7.10	10K	0.160	0.020	0.002	0.002
72/08/09	18 10	0000			96	50K	6.80	10K	0.160	0.010K	0.006	0.002
	18 10	0004	19.1	13.0		50K	6.80	10K	0.140	0.010K	0.003	0.003
	18 10	0015	19.1	9.0		50K	6.80	10K	0.060	0.010K	0.006	0.004
72/10/01	14 35	0000			216	50K	6.70	10K	0.150	0.080	0.010	0.009
	14 35	0004	14.1	12.4		50K	6.70	10K	0.150	0.040	0.006	0.005
	14 35	0015	14.0	9.2		50K	6.70	10K	0.140	0.050	0.007	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	12 05	0000	1.1J
72/08/09	18 10	0000	2.0J
72/10/01	14 35	0000	1.1J

STORET RETRIEVAL DATE 74/06/25

230906
45 35 18.0 069 42 42.0
MOOSEHEAD LAKE
23 MAINE

11EPALES 2111202
3 0015 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	15 40	0000	12.6	11.7	186	20	7.05	10K	0.160	0.020	0.003	0.002
	15 40	0013	10.6	12.1		20	7.00	10K	0.170	0.020	0.006	0.003
72/08/09	17 30	0000			144	50K	6.90	10K	0.180	0.170	0.005	0.003
	17 30	0004	18.1	11.0		50K	6.80	10K	0.160	0.020	0.003	0.003
	17 30	0009	18.1	13.0		50K	6.70	10K	0.120	0.030	0.005	0.003
72/10/01	11 25	0000			168	50K	6.70	10K	0.140	0.060	0.008	0.008
	11 25	0004	13.6	9.0		50K	6.70	10K	0.140	0.030	0.008	0.007
	11 25	0010	13.4	9.2		50K	6.70	10K	0.140	0.040	0.008	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	15 40	0000	1.2J
72/08/09	17 30	0000	1.2J
72/10/01	11 25	0000	1.1J

STORET RETRIEVAL DATE 74/06/25

230907
45 35 36.0 069 41 06.0
MOOSEHEAD LAKE
23 MAINE

11EPALES
3

2111202
0100 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	15 55	0000	10.2	11.7	200	15	7.00	10K	0.150	0.020	0.003	0.003
	15 55	0015	8.7	11.7		20	7.05	10K	0.170	0.010	0.003	0.002
	15 55	0020	8.9									
	15 55	0025	8.4									
	15 55	0030	7.9									
	15 55	0035	7.1									
	15 55	0040	6.5									
	15 55	0045	6.1									
	15 55	0050	5.8									
	15 55	0055	5.6									
	15 55	0060	5.4									
	15 55	0068	5.0									
	15 55	0090	5.0									
	15 55	0100	4.9									
72/08/09	16 50	0000				20	7.00	10K	0.170	0.020	0.004	0.002
	16 50	0004	18.3	8.8	132	50K	6.80	10K	0.170	0.130	0.005	0.003
	16 50	0015	19.3	8.8		50K	6.80	10K	0.150	0.010K	0.003	0.002
	16 50	0022	18.1	9.0		50K	6.80	10K	0.110	0.010K	0.004	0.003
	16 50	0030	16.9	8.8		50K	6.60	10K	0.180	0.020	0.004	0.004
	16 50	0040	14.2	8.2		50K	6.60	10K	0.180	0.010K	0.005	0.004
	16 50	0051	12.2	8.8		50K	6.40	10K	0.120	0.010	0.005	0.004
72/10/01	15 25	0000	14.0		264	50K	6.30	10K	0.090	0.040	0.006	0.005
	15 25	0004	14.0	9.2		50K	6.70	10K	0.150	0.050	0.004	0.003
	15 25	0015	14.0	9.1		50K	6.70	10K	0.150	0.040	0.010	0.006
	15 25	0020	14.0	9.2		50K	6.80	10K	0.150	0.040	0.012	0.006
	15 25	0027	14.0	9.0		50K	6.70	10K	0.150	0.040	0.013	0.006
	15 25	0033	14.0	9.2		50K	6.70	10K	0.150	0.040	0.011	0.007
	15 25	0040	13.7	9.0		50K	6.80	10K	0.150	0.040	0.013	0.008
	15 25	0046	13.9	9.0		50K	6.80					
	15 25	0053	14.1	9.2		50K	6.80					
						50K	6.70					

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	15 55	0000	1.0J
72/08/09	16 50	0000	1.2J
72/10/01	15 25	0000	1.3J

APPENDIX C

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

K - Value is less than indicated
J - Value known to be in error

STORET RETRIEVAL DATE 74/06/25

2309A1 LS2309A1
45 35 00.0 069 43 30.0
KENNEBECK RIVER E OUTLET
23 15 MOOSEHEAD LK
O/MOOSEHEAD LAKE
ST HWY 15 BRDG W OF MOOSEHEAD
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 30		0.217	0.265	0.265	0.005K	0.006
72/10/14	13 00		0.150	0.250	0.063	0.005K	0.005K
72/11/04	11 50		0.130	0.440	0.025	0.005K	0.006
72/12/10	11 15		0.130	0.210	0.005K	0.005K	0.005K
73/01/06	11 45		0.132	0.160	0.013	0.005K	0.005K
73/02/04	10 15		0.138	0.130	0.033	0.005K	0.005K
73/04/07	11 30		0.150	1.000	0.016	0.010	0.010
73/04/21	08 30		0.147	1.000	0.034	0.006	0.006
73/05/05			0.147	0.210	0.020	0.005K	0.005K
73/05/19	13 00		0.147	0.400	0.075	0.005K	0.009
73/06/02	09 25		0.132	0.500	0.025	0.006	0.017
73/07/14	09 35		0.126	0.180	0.016	0.005K	0.005K
73/08/17	10 50		0.100	0.600	0.063	0.009	0.025

STORET RETRIEVAL DATE 74/06/25

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 2309B1          LS2309B1
45 39 00.0 069 44 30.0
WEST OUTLET
23       15 MOOSEHEAD LK
0/MOOSEHEAD LAKE
ST HWY 15 BRDG S OF ROCKWOOD
11EPALES                2111204
4                       0000 FEET  DEPTH
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DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 50		0.130	0.150	0.033	0.006	0.010
72/10/14	13 30		0.130	0.250	0.046	0.005K	0.006
72/11/04	11 45		0.130	0.320	0.032	0.005K	0.007
72/12/10	11 30		0.126	0.220	0.005K	0.005K	0.005K
73/01/06	12 00		0.138	0.610	0.029	0.005K	0.006
73/02/04	10 22		0.154	0.150	0.019	0.005K	0.005K
73/03/03	12 40		0.180	0.500	0.043	0.005K	0.005K
73/04/07	11 40		0.160	0.420	0.030	0.005K	0.005K
73/04/21	11 30		0.138	0.535	0.044	0.005K	0.010
73/05/05			0.130	0.210	0.011	0.005K	0.005K
73/05/19	13 30		0.120	0.300	0.046	0.006	0.006
73/06/02	09 35		0.115	0.350	0.024	0.006	0.010
73/07/14	09 45		0.085	0.290	0.027	0.009	0.012
73/08/17	11 02		0.088	0.880	0.026	0.006	0.010

STORET RETRIEVAL DATE 74/06/25

2309C1 LS2309C1
45 41 00.0 069 46 03.0
MOOSE RIVER
23 15 BRASSUA LK
I/MOOSEHEAD LAKE
BRDG OFF ST HWY 15 W OF ROCKWOOD
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	14 00		0.079	0.275	0.032	0.005K	0.009
72/10/14	13 35		0.078	0.200	0.054	0.005K	0.008
72/11/04	11 30		0.062	0.560	0.069	0.005K	0.016
72/12/10	11 45		0.056	0.400	0.021	0.005K	0.011
73/04/07	11 45		0.220	0.580	0.058	0.005K	0.010
73/04/21	08 00		0.189	0.460	0.028	0.005K	0.010
73/05/05			0.140	0.310	0.018	0.005K	0.010
73/05/19	13 40		0.110	0.370	0.027	0.006	0.010
73/06/02	09 40		0.089	0.390	0.016	0.006	0.010
73/07/14	09 55		0.058	0.260	0.024	0.005K	0.005K
73/08/17	11 15		0.040	1.050	0.032	0.005K	0.010

STORET RETRIEVAL DATE 74/06/25

2309D1 LS2309D1
45 44 30.0 069 50 00.0
TOMHEGAN SIREAM
23 15 BRASSUA LAKE
T/MOOSEHEAD LAKE
BRDG W OF TOMHEGAN
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	14	20	0.082	0.650	0.154	0.015	0.018
72/10/14	13	50	0.056	0.400	0.063	0.005K	0.014
72/11/04	11	00	0.087	0.440	0.039	0.005K	0.016
73/03/03	12	20	0.140	0.220	0.030	0.005K	0.005K
73/05/05			0.025	0.340	0.029	0.005K	0.010
73/06/02	10	00	0.015	0.520	0.020	0.006	0.015
73/07/14	10	15	0.026	0.540	0.022	0.005K	0.020
73/08/17	11	25	0.011	0.660	0.031	0.006	0.025

STORET RETRIEVAL DATE 74/06/25

2309E1 LS2309E1
45 40 30.0 069 27 00.0
ROACH RIVER-OUTLET 1ST ROACH PON
23 15 1ST ROACH PON
T/MOOSEHEAD LAKE
BRDG AT KOKAJDO
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	11 05		0.047	0.625	0.031	0.005K	0.007
72/10/14	11 15		0.095	0.950	0.077	0.005K	0.006
72/11/04	14 00		0.072	0.320	0.029	0.005K	0.007
72/12/10	10 15		0.072	0.150	0.009	0.005K	0.006
73/01/06	10 15		0.090	1.260	0.079	0.005K	0.005K
73/02/04	09 15		0.086	0.140	0.012	0.007	0.007
73/03/03	11 00		0.098	0.250	0.031	0.005K	0.005K
73/04/07	10 10		0.092	0.500	0.015	0.005K	0.005K
73/04/21	10 15		0.088	0.260	0.012	0.005K	0.005K
73/05/05	10 00		0.084	0.180	0.026	0.005K	0.005K
73/05/19	15 00		0.081		0.120	0.010	0.015
73/06/02	11 50		0.072	0.130	0.005K	0.005K	0.015
73/07/14	12 00		0.035	0.140	0.031	0.005K	0.005K
73/08/17	11 40		0.015	0.150	0.017	0.020	0.020

STORET RETRIEVAL DATE 74/06/25

2309F1 LS2309F1
45 36 00.0 069 30 30.0
LILY BAY BROOK
23 15 MOOSEHEAD LK
T/MOOSEHEAD LAKE
BRDG W SIDE OF LILY BAY
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	10 40		0.185	0.400	0.046	0.008	0.009
72/10/14	11 00		0.117	0.750	0.075	0.005K	0.008
72/11/04	15 50		0.120	0.330	0.026	0.005K	0.010
73/04/07	10 00		0.120	1.600	0.048	0.005K	0.010
73/04/21	10 00		0.067	0.330	0.012	0.005K	0.010
73/05/05	08 40		0.130	0.160	0.019	0.005K	0.010
73/05/19			0.072	0.460	0.021	0.007	0.015
73/06/02	11 40		0.087	0.400	0.120	0.008	0.020
73/07/14	11 45		0.126	0.200	0.016	0.005K	0.010
73/08/17	11 50		0.084	0.600	0.027	0.006	0.020

STORET RETRIEVAL DATE 74/06/25

2309G1 LS2309G1
45 34 30.0 069 32 00.0
MUD BROOK
23 15 MOOSEHEAD LK
T/MOOSEHEAD LAKE
BRDG SE CORNER OF MATHEWS COVE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	10 30		0.075	0.800	0.115	0.019	0.022
72/10/14	10 40		0.042	0.800	0.086	0.005K	0.015
72/11/04	13 50		0.056	0.780	0.110	0.005K	0.016
72/12/10	10 00		0.063	0.740	0.180	0.005K	0.010
73/04/07	09 50		0.044	0.410	0.023	0.005K	0.005K
73/04/21	12 00		0.025	1.000	0.044	0.006	0.010
73/05/05	08 30		0.014	0.330	0.056	0.005K	0.010
73/05/19	14 40		0.011		0.110	0.009	0.015
73/06/02	11 30		0.012	0.460	0.040	0.006	0.015
73/07/14	11 35		0.024	0.800	0.033	0.005K	0.015
73/08/17	12 05		0.010K	1.540	0.024	0.005K	0.020

STORET RETRIEVAL DATE 74/06/25

230941 LS2309H1
45 32 00.0 069 33 00.0
BEAVER POND-OUTLET OF PRONG POND
23 15 MOOSEHEAD LK
T/MOOSEHEAD LAKE
BRDG SE END OF BEAVER COVE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	12 20		0.032	0.425	0.063	0.005K	0.014
72/10/14	10 24		0.032	0.350	0.054	0.005K	0.010
72/11/04	13 30		0.022	0.460	0.040	0.005K	0.012
72/12/10	09 50		0.029	0.370	0.005K	0.005K	0.008
73/01/06	09 30		0.052	0.380		0.005K	0.010
73/02/04	08 55		0.088	0.360	0.034	0.007	0.007
73/03/03	10 20		0.100	0.390	0.038	0.005K	0.005K
73/04/07	09 45		0.110	1.320	0.063	0.005K	0.015
73/04/21	09 00		0.100	0.750	0.024	0.005K	0.010
73/05/05	08 20		0.037	0.220	0.007	0.005K	0.010
73/05/19	14 30		0.018		0.060	0.007	0.010
73/06/02	11 15		0.010K	0.410	0.050	0.006	0.015
73/07/14	11 25		0.010K	0.440	0.025	0.007	0.010
73/08/17	12 05		0.010K	0.300	0.014	0.005K	0.010

STORET RETRIEVAL DATE 74/06/25

2309J1 LS2309J1
45 27 30.0 069 37 30.0
NO NAME
23 15 GREENVILLE
T/MOOSEHEAD LAKE
ST HWY 15 BRDG IN GREENVILLE JCT
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	12 50		0.088	0.650	0.086	0.009	0.021
72/10/14	12 40		0.039	1.050	0.063	0.005K	0.013
72/11/04	12 15		0.040	0.420	0.038	0.005K	0.009
73/04/07	10 45		0.063	0.920	0.026	0.005K	0.015
73/04/21	08 10		0.025	0.960	0.025	0.005K	0.010
73/05/05	10 30		0.027	0.220	0.011	0.005K	0.010
73/05/19	12 45		0.024	0.420	0.008	0.007	0.015
73/06/02	09 05		0.016	0.390	0.023	0.006	0.020
73/07/14	09 15		0.048	0.640	0.044	0.005K	0.015
73/08/17	10 15		0.033		0.132	0.032	

STORET RETRIEVAL DATE 74/06/25

2309K1 LS2309K1
49 29 30.0 069 40 00.0
SQUAW BROOK
23 15 GREENVILLE
T/MOOSEHEAD
ST HWY 15 BRDG NW OF GREENVILLE JCT
11EPALES 2111204
4 0000 FEET DEPTH

9/11

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 05		0.117	0.400	0.042	0.005K	0.006
72/10/14	12 45		0.039	0.200	0.048	0.005K	0.005K
72/11/04	12 10		0.059	0.310	0.035	0.005K	0.007
73/04/21	11 45		0.076	0.480	0.012	0.005K	0.010
73/05/05			0.090	0.150	0.011	0.005K	0.005K
73/05/19	13 00		0.061		0.128	0.010	0.015
73/06/02	09 15		0.071	0.220	0.060	0.006	0.010
73/07/14	11 00		0.060	0.150	0.026	0.005K	0.005K
73/08/17	10 25		0.048	0.130	0.021	0.007	0.010

STORET RETRIEVAL DATE 74/06/25

2309L1 LS2309L1
45 30 30.0 069 40 30.0
UPPER SQUAW BROOK
23 15 MOOSEHEAD LK
T/MOOSEHEAD LK
ST HWY 15 SE OF MT VIEW POND
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 20		0.094	0.450	0.110	0.008	0.016
72/11/04	12 10		0.032	0.440	0.058	0.005K	0.014
72/12/10	11 00		0.013	0.420	0.007	0.005K	0.006
73/04/07	11 20		0.096	0.440	0.069	0.005K	0.005K
73/04/21	08 30		0.069	1.100	0.054	0.005K	0.010
73/05/05			0.062	0.195	0.015	0.005K	0.010
73/05/19	13 15		0.010K	0.310	0.005K	0.005K	0.010
73/06/02	09 20		0.010K	0.140	0.019	0.006	0.015
73/07/14	09 25		0.010K	0.320	0.011	0.005K	0.010
73/08/17	10 23		0.010K	0.370	0.006	0.005K	0.015